UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/001,940	11/29/2001	Holger Nolte	CRR0001	8873

7590	05/01/2006	EXAMINER

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ART UNIT	PAPER NUMBER
2173	

DATE MAILED: 05/01/2006

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PTO-90C (Rev. 10/03)

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Application Number: 10/001,940
Filing Date: November 29, 2001
Appellant(s): NOLTE ET AL.

Annette K. Kwok
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 3 April 2006, appealing from the Office

action mailed 5 August 2005.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is substantially correct, only the reference Montgomery et al. is listed at page 11 as "U.S. Patent No. 5,969,533", where it should properly be US #5,**696**,533.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

5,945,976	IWAMURA et al.	8-1999
5,696,533	MONTGOMERY et al.	12-1997

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1 – 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iwamura et al. ("Iwamura"; US #5,945,976) in view of Montgomery et al. ("Montgomery"; US #5,696,533).

As per independent claim 1's "graphical user interface" in which "a rendered image of at least one graphical object" appears "on a display device", Iwamura's GRAPHIC DATA PROCESSING SYSTEM produces scene data by which a three-dimensional scene image is generated and displayed (Abstract). Please note such displays as Iwamura's figs 14A, 14B, in which "graphical object" depictions appear in a "graphical user interface". This is a three dimensional image with which a user interacts with an indication cursor (fig 5A,col 7, lines 5 – 16).

While some form of "pixel" graphics *per se* is necessarily involved in Iwamura, Iwamura does not extend to providing **explicit** teachings of "a color value stored for each pixel" along with "object identification data stored with each pixel covered by the rendered image", whereby this "identifies the graphical object located at the pixel", though Iwamura's indication cursor appears to call up an "object" through some procedure. Also, it should be kept in mind that Iwamura must produce the graphical image and provide for proper access with the indication cursor, meaning both graphical rendering and pick-handling of some form should be used.

However, Montgomery's METHOD FOR SELECTING AN ITEM ON A GRAPHICS SCREEN is one in which an item buffer is used to assign a unique item

identifier to members of a graphics object list (Abstract). The explicit teachings of

Montgomery in this regard appear in fig 2, where an item buf with item num entries is

run in parallel with a frame buf containing color values. This means that for each pixel

color indication, there is an item that corresponds to it, as in applicant's "color

value"/"object identification data stored with each pixel".

Thus, it would have been obvious to a person having ordinary skill in the art at

the time of applicant's invention to use the item buffer technique of Montgomery to

assign "identification data" to the scene image objects of Iwamura. The motivation is to

provide the Iwamura user with a direct indexing to the identities of the contents of the

scene image, whereby the indication cursor, when pointed to an Iwamura object, will

properly return "object identification" from the pre-stored Montgomery item buf contents

at that pointed-to location. The environment envisioned by Montgomery can extend to

Painting and Texturing on 3D Shapes (col 2, lines 6 – 11), so that a motivation is also

seen in Montgomery for application of the item buffer to three-dimensional pixel

graphics like Iwamura's.

What results in the combination is that an Iwamura image, rendered to appear

proper in the two-dimensional display, has a buffered index for handling picks like that

of Montgomery, where selection anywhere on the screen will return the identifier of the

object pointed to.

Claim 2's "three-dimensional image comprising at least two graphical objects that

are co-located" (see also claims 12, 23, 30) is seen in Iwamura, where one building

appears behind another in fig 14A. Using the Montgomery item buffer, only the "visible

graphical object" will obtain the value for that object in memory. A similar line of reasoning applies to claim 13.

The "writing" (claims 3, 14, 25) and "reading" (claims 4, 15) of "frame buffer" data occurs in Montgomery (thus "describing how each graphical element is to be displayed" along with an "object identification value" in a parallel "frame buffer" organization (see claim 26)), and the use of a "cursor pointing to a particular coordinate" (claims 5, 16) is part of both Iwamura, with the indication cursor and Montgomery, with a pointer device. In the combination of references, "reading the object identification data" (claims 6, 10, 17, 27, 31) takes place in Montgomery, to supply "object identification data" for Iwamura's scene.

Claim 7's "exporting the object identification information" (see also claim 18) is seen in Iwamura, where "metadata information" (claims 8, 19, 28, 32) as appears in the region 1207 or 1303 (fig 15A) is provided. This data is made part of an "object-identification value indexed data structure" (claims 9, 20), when the Montgomery item buffer values are used to call such data from Iwamura's store. See also claim 21, in which "a metadata information display object" reads upon Iwamura's supplemental scene display.

Independent claim 11's "rendering an image of a plurality of graphical objects" reads upon Iwamura, for reasons similar to those given above for claim 1, and the use of "a color value" and "object identification data for each of the specified locations" is then suggested by the combination with Montgomery, where "locations" are indicated by

the <u>item buffer</u> designations for the pixels that are involved. A similar line of reasoning

applies to independent claims 22, 33.

Independent claim 24's "associating a unique object identification value with each

graphical element" is suggested by Montgomery, when applied to the "graphical

element" composition of Iwamura's <u>scene</u>. There, the "data structure" behind the

supplemental displays will add <u>metadata</u> to the <u>item num</u> listings in Montgomery. A

similar line of reasoning applies to independent claim 29.

The "computerized system" in claim 34, with its "pixels" that have "a unique

object identification (ID) value" reads upon Montgomery, as noted above. The

"rendering process" that determines "visible surfaces", as also discussed above, is seen

in Iwamura. Montgomery then provides a "pixel map" to accomplish "object

identification" of those objects that are Iwamura-rendered.

The use of "a pointer" in relation to "at least one graphical object" (independent

claim 35) is found in Iwamura, and the "frame buffer" whose "first field" is "for holding

display information" and whose "second field" is "for holding object identification

information" is suggested by Montgomery.

The "frame buffer" of independent claim 36 is largely suggested by the "pixel"

"memory locations" of Montgomery, which can be used in combination with the display

of "a unique software graphical object" as per Iwamura.

Independent claim 37's "graphical user interface", in which "there is stored a

respective color value for each pixel in the display device", along with "object

identification data stored with each pixel" also reads upon the combination of Iwamura's

"three-dimensional graphical object rendering", when combined with Montgomery's

parallel buffering of color and item information.

Independent claim 38's "rendered image produced using a z-buffer technique" is

suggested by the display of overlapping objects with hidden surface removal in

Iwamura, especially when considered in view of the item buffering of Montgomery,

where a frontmost item is indicated for each pixel. The comparison and retention of

closest z-values is a part of any arrangement in which pixels must be shown with

topmost priority in a "three-dimensional graphical" display. Indeed, Iwamura identically

teaches at col 8, lines 53 – 65 that the ground object data can be obtained by a Z buffer

method. Claim 38's use of "object identification data stored with each pixel" is then

seen, as has been noted above, in Montgomery, whose returning of a visible item

identification for each pixel would have a direct usefulness in the access of related data

as is illustrated in Iwamura.

(10) Response to Argument

At page 12 of the brief, appellant argues that "none of the references discloses,

suggests or even appreciates a graphical user interface that includes a rendered image

of at least one graphical object, wherein the graphical object uses a number of pixels on

a display device and a color value stored for each pixel in the display device". However,

a rendered image like Iwamura's will produce an array of varied "color value" entries for

a "graphical object". Montgomery is then relied upon to show the identical use of a

parallel "color value"/"object identification data" buffering arrangement, of the kind that "uniquely identifies the graphical object located at" a "pixel", as in independent claim 1.

Appellant's argues at page 13 that **"the Office Action has misinterpreted the claim limitation *'a color value stored for each pixel in the display device.'"**", in relying upon the reference Montgomery, in which "there is a but a single color available for each object" (see page 12 of brief). But it is pointed out that even in the identical disclosure of solid-colored objects used in Montgomery, there is "a color value stored for each pixel in the display device". The Examiner is not permitted to "read in" as appellant would, "that the only interpretation feasible dictates a separate/respective color value for each pixel in a display device", since neither "separate" nor "respective" actually appears in the claims.

But even if the claim is made to require "separate" color values stored for a "graphical object", the combination with Iwamura suggests that colors become variable throughout the content of a scene, where objects there are not rendered in single colors across their units. Iwamura's rendering is ideally-suited to carry forward into a pick-testing scheme like Montgomery's, where the pixel-by-pixel colors are then read into the color-maintaining portion of memory along with the parallel <u>item buffer</u>.

Appellant's argument is thus answered at page 13, where "Applicants do point out that not every pixel in the Montgomery device is covered by an object, only objects within the display"—Iwamura produces a rendering of an entire scene, as bounded by a rectangular border. All points within such a display should be rendered and addressable by the pointing device.

At page 14, appellant, in questioning the motivation given by the Examiner for the combination of the references, argues that "the stated motivation is not found in any reference of record, or supported by any basis or theory having support in the references of record". However, the Examiner has attempted to show that pixel graphics selectable by a pointer as in Iwamura provide a motivation, as seen in that reference, for some procedure for identifying which objects in the image have been picked, something that is done with the item buffer of Montgomery. Also, the Montgomery disclosure, as has been noted in above, is envisioned as being useful with 3D imagery, this being a motivation found within Montgomery to use the item buffer with rendered 3D images like Iwamura's.

At page 14 appellant also questions the combination by arguing that "it is not apparent that the virtual reality simulator of Iwamura is remotely compatible with, or would benefit from, the item buffer described in Montgomery as compared to the present (z-buffering) system used by Iwamura". However, the three-dimensional technique of z-buffering, as is mentioned in Iwamura, is principally used for hidden surface removal and the presentation of proper priority. It is essentially an image rendering technique, and not a pick-handling technique, this being accomplished by a further mapping to an item buffer such as Montgomery's, so that the objects shown as foremost by z-buffering are then able to accept pointer selection by the user.

Appellant continues on the subject of inapplicability of Iwamura and z-buffering at page 15, arguing that "there is absolutely no subsequent use for any item-buffer as the z-buffering process already renders each pixel observable from a given perspective on

a two-dimensional display." But while rendering "each pixel observable" might be "a fundamental purpose of z-buffering", there is still a need for an all-points-addressable screen to be able to respond to item selections via a cursor. Simply rendering the image does not complete the process of indexing relative to the positions entered by the pointer. For this, there is suggested in Iwamura a need for an <u>item buffer</u> like Montgomery's.

Appellant argues at page 15 that in Montgomery, "only two-dimensional systems are described, and only two-dimensional objects, e.g., rectangles and triangles, are discussed." However, in producing an image like Iwamura's it is first required that a two-dimensional representation, such as can be handled by Montgomery, be produced. Indeed, Montgomery actually refers to <u>3D</u> rendering in the background of the invention, and can be seen as useful in that particular area of graphical rendering, presentation and interaction.

Appellant's argument at pages 15 – 16 that "nowhere does Montgomery provide for any change in viewing perspective" is not relevant to the manner in which the references are relied upon and combined. Iwamura has ample teachings of 3D rendering, of the kind where viewpoint varies. It is the combination of references that the Examiner relies upon, and appellant is not entitled to attack references one at a time, given the motivation for that combination that exists. This also answers the argument at page 16 that "the process shown in Montgomery might be perhaps closest to a technique known as 'z-sorting.', since it is merely the parallel use of frame buffering for colors and item buffering for object selection that is relied upon in Montgomery, and

this has direct usefulness in an image produced by standard z-buffering such as Iwamura's.

The Examiner disagrees, then, with appellant's argument at page 17; that "One cannot functionally append an item buffer to a z-buffer – it makes no sense technically and serves no purpose". The z-buffering to render an image needs a further mapping to handle picks, and Montgomery has immediate usefulness with Iwamura. The Examiner is not attempting to "replace a z-buffer with an item buffer", but rather, to use them together. Contrary to appellant's arguments, "item buffers" **are** "suited to three dimensional rendering", since such "rendering" produces a two-dimensional image of the kind Montgomery can present. But rendering alone is only part of producing an interactive 3D image like Iwamura's; it only presents the pixel values for display. There must also be a mapping of screen positions to objects that will react to the pointing device, and for this, an object-segmenting, item buffer arrangement like Montgomery's is suggested to accomplish this function.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

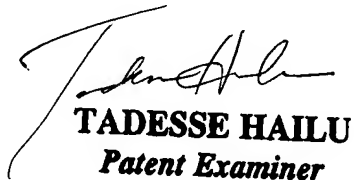Raymond J. Bayerl

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